

65) Point
 $(-2, -2)^*$
 parallel to $x + 2y = 10$ → $2y = 10 - x$
 $(0, 5)$
 $(10, 0)$
 same slope $y = 5 - \frac{1}{2}x$
 $\text{Slope} = -\frac{1}{2}$
 $y + 2 = -\frac{1}{2}(x + 2)$
 $y + 2 = -\frac{1}{2}x - 1$
 $2y + 4 = -x - 2$
 $x + 2y + 4 = -2$
 $x + 2y = -6$
 $2y = -6 - x$
 $y = -3 - \frac{1}{2}x$

Warm-Up: Graph the following system of equations and find the point of intersection.

$y = 2x - 5$
 $-x + 3y = 6$
 $(0, 2)$
 $(-6, 0)$

Slope Int
 $x - 3y = -6$

$(4, 3)$

Ex #1: Solve the system of equations from the warm-up using **Substitution**.

$$\begin{aligned} y &= 2x - 5 \\ -x + 3y &= 6 \end{aligned}$$

① Isolate a variable
 $y = 2x - 5$

② Substitute into other equation using step 1 and solve

$$\begin{aligned} -x + 3(2x - 5) &= 6 \\ -x + 6x - 15 &= 6 \\ 5x - 15 &= 6 \\ 5x &= 21 \\ x &= \frac{21}{5} \end{aligned}$$

Why was substitution easy to use for this system?

$(\frac{21}{5}, \frac{17}{5})$

③ Plug value from Step 2 into equation from step 1

$$\begin{aligned} y &= 2(\frac{21}{5}) - 5 \\ y &= \frac{42}{5} - 5 \\ 5y &= 42 - 25 \\ 5y &= 17 \\ y &= \frac{17}{5} \end{aligned}$$

Ex #2: Solve the following system of equations using **Substitution**.

$$\begin{aligned} 4x + y &= 5 \\ 2x - 3y &= 13 \end{aligned}$$

① Isolate Variable
 $y = 5 - 4x$

② Subst into 2nd equation and solve

$$\begin{aligned} 2x - 3(5 - 4x) &= 13 \\ 2x - 15 + 12x &= 13 \\ -15 + 14x &= 13 \\ 14x &= 28 \\ x &= 2 \end{aligned}$$

$(2, -3)$

③ $y = 5 - 4(2) = 5 - 8 = -3$

Ex #3: Solve the following system of equations using **Elimination**

Solve for x

$$\begin{array}{r} 12x + 3y = 15 \\ 2x - 3y = 13 \\ \hline 14x = 28 \\ x = 2 \end{array}$$

Solve for y

$$\begin{array}{r} 4x + y = 5 \\ -4x + 6y = -26 \\ \hline 7y = -21 \\ y = -3 \end{array}$$

Ex #4: Solve the following system of equations:

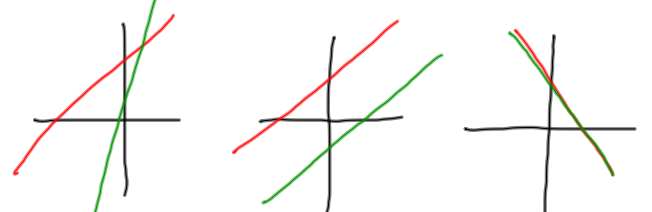
$$\begin{array}{r} 8x + 4y = 24 \quad | \quad (2x + y = 6) \\ -8x - 4y = -24 \quad | \quad (-8x - 4y = -24) \\ \hline 0 = 0 \end{array}$$

True: ∞ Solutions

~~all Real #s~~
~~(-2, -5)~~

0 = -24

False: No Solution



Cross | Solution
Consistent
Independent

Parallel
Inconsistent
Independent

Same lines
Consistent
Dependent

Inconsistent:

Dependent:

HW: p 180 #58-66

